Claims

1. Dimer and multimer forms of BAPO compounds of the formula I

$$\begin{bmatrix} O \\ \downarrow \\ P \\ \downarrow \end{bmatrix}_n \begin{bmatrix} O \\ \downarrow \\ P \\ \downarrow \end{bmatrix}_m \begin{bmatrix} O \\ \downarrow \\ P \\ \downarrow \end{bmatrix}_m$$

wherein

R₁ is unsubstituted or substituted C₁-C₁₂alkyl, benzyl, C₁-C₁₂alkoxy, C₃-C₆cycloalkyl or C₅-C₁₄aryl;

R₂ is unsubstituted or substituted C₃-C₆cycloalkyl or C₅-C₁₄aryl;

Q is à di-tri or tetravalent arylene residue;

n is 1-4, m is 0-2, n+m is 2, 3 or 4.

2. Dimer and multimer forms of MAPO compounds of the formula II

wherein

 R_1 and R_3 independently of one another are unsubstituted or substituted C_1 - C_{12} alkyl, benzyl, C_1 - C_{12} alkoxy, C_3 - C_6 cycloalkyl or C_5 - C_{14} aryl;

Q is a di-tri or tetravalent arylene residue;

n is 1-4, m is 0-2, n+m is 2, 3 or 4;

with the proviso, that R₁ and R₃ are different from each other.

3. Process for the preparation of dimer or multimer forms of BAPO compounds of the formula I and of dimer or multimer forms of MAPO compounds of the formula II, characterized in that (n + m) equivalents of a dimetalated-phosphine $R_1P(M)_2$ are reacted

with one equivalent of a di-or polycarboxylic acid halogenide

to form an intermediate of the formula III

the intermediate is then reacted either with (n + m) equivalents of a further carboxylic acid halogenide (R_2 -CO-Hal) to form dimer or multimer forms of **bisacyl**phosphine-intermediates of the formula IV

$$\begin{bmatrix} O & P_2 & P_2 & O \\ P_1 & P_2 & P_3 & P_4 \end{bmatrix}_m$$

or with (n + m) equivalents of a halogenide R_3 -Hal to form dimer or multimer forms of monoacylphosphine intermediates of the formula V,

said phosphines IV or V are then oxidized to form phosphine oxides of the formula I or II, wherein M is Li, Na or K; and R_1 , R_2 and R_3 ; Q; n and m are as defined in claims 1 and 2.

4. Compounds of the formula III

wherein M, R₁, n and m are as defined in claim 3.

5. Cyclic forms of BAPO compounds of the formula VI or VII

wherein

7.

- R₁ is unsubstituted or substituted C₁-C₁₂alkyl, benzyl, C₁-C₁₂alkoxy, C₃-C₆cycloalkyl or C₅-C₁₄aryl;
- U is a divalent arylene residue and U' is a tetravalent arylene residue.
- 6. Process for the preparation of cyclic forms of BAPO compounds of the formula VI characterized in that one equivalent of a dimetalated-phosphine $R_1P(M)_2$ are reacted with one equivalent of a dicarboxylic acid halogenide

to form an intermediate of the formula III'

said intermediate cyclizes and is then oxidized to form phosphine oxides of the formula VI, wherein M is Li, Na or K; R₁ and U are as defined in claim 5.

7. Process for the preparation of cyclic forms of BAPO compounds of the formula VII characterized in that two equivalent of a dimetalated-phosphine $R_1P(M)_2$ is reacted with one

equivalent of a tetracarboxylic acid halogenide

to form an intermediate of the formula III"

said intermediate cyclizes and is then oxidized to form phosphine oxides of the formula VII wherein M is Li, Na or K; R₁ and U' are as defined in claim 5.

- 8. Process according to any one of claims 3, 6 or 7, wherein M is Li and wherein the process is carried out in an inert atmoshere at a temperature from -20 to 80°C.
- 9. Compounds according to any one of claims 1, 2 or 4, wherein n is 1 and m is 1.

- 10. Photopolymerizable composition comprising
- (a) at least one ethylenically unsaturated photopolymerizable compound, and
- (b) as photoinitiator, at least one compound of the formula I, II, VI or VII as defined above.